AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) An exposure method comprising:

preparing a first mask in which a size of a mask pattern is measured in advance;

applying exposures on the first mask to form resist patterns;

obtaining an exposure curve of sizes of the formed resist patterns to quantities of the applied exposures;

calculating a first exposure quantity to be applied to the first mask from the exposure curve to provide a first resist pattern ~~by using the first mask~~;

simulating an optical intensity ~~distributions~~ distribution on a wafer in a case where the first mask is used and an optical intensity distribution on the wafer in a case where a second mask is used, a size of a mask pattern of the second mask being measured in advance;

calculating a difference in optical intensity between the first mask and the second mask from the simulated optical intensity distributions; and

calculating a second exposure quantity to be applied to the second mask to provide a second resist pattern, from the first exposure quantity and the difference in optical intensity.

2. (Original) The exposure method according to claim 1, wherein the mask pattern of each of the first mask and the second mask is a line-and-space pattern.

3. (Currently amended) An exposure method comprising:

preparing a first mask in which a size of a mask pattern is measured in advance;

applying exposures on the first mask to form resist patterns;

obtaining an exposure curve of sizes of the formed resist patterns to quantities of the applied exposures;

calculating a first exposure quantity to be applied to the first mask from the exposure curve to provide a first resist pattern ~~by using the first mask~~;

calculating an exposure quantity difference from a mask pattern size difference of mask patterns between the first mask and a second mask by an optical simulation, a size of a mask pattern of the second mask being measured in advance;

calculating a [[ratio]] percentage of the exposure quantity difference in the second mask with respect to the first exposure quantity to be applied to the first mask, from the exposure quantity difference; and

calculating a second exposure quantity to be applied to the second mask to provide a second resist pattern, from the first exposure quantity and the [[ratio]] percentage of the exposure quantity difference.

4. (Original) The exposure method according to claim 3, wherein the mask pattern of each of the first mask and the second mask is a line-and-space pattern.

5. (Currently amended) An exposure method comprising:

preparing a first mask in which a size of a mask pattern is measured in advance;

applying exposures on the first mask to form resist patterns by using a first exposure device;

obtaining an exposure curve of sizes of the formed resist patterns to quantities of the applied exposures;

calculating a first exposure quantity to be applied to the first mask from the exposure curve to provide a first resist pattern ~~by using the first mask and a first exposure device~~;

simulating an optical intensity distribution on a wafer in a case where the first mask is used and an optical intensity distribution on the wafer in a case where a second mask is used, a size of a mask pattern of the second mask being measured in advance;

calculating a difference in optical intensity between the first mask and the second mask from the simulated optical intensity distributions;

calculating a second exposure quantity to be applied to the second mask to provide a second resist pattern in a case where the first exposure device is used, from the first exposure quantity and the difference in optical intensity;

determining a third exposure quantity to be applied to the first mask to provide the first resist pattern in a case where [[the]] a second exposure device is used, from exposure data accumulated, and calculating a difference between the third exposure quantity and the first exposure quantity; and

calculating a fourth exposure quantity to be applied to the second mask to provide the second resist pattern in a case where the second exposure device is used, from the difference in exposure quantity and the difference in optical intensity.

6. (Original) The exposure method according to claim 5, wherein the mask pattern of each of the first mask and the second mask is a line-and-space pattern.

7. (Original) The exposure method according to claim 5, wherein each of the first exposure device and the second exposure device is an excimer laser exposure device.

8. (Currently amended) An exposure quantity calculating system comprising:

an exposure device;

exposure calculating unit connected to the exposure device, an input unit configured to input data, a mask pattern size measuring unit configured to measure a size of a mask pattern of a mask, a resist pattern size measuring unit configured to measure a size of a pattern formed on a resist film, and a storage configured to store data; and

an optical intensity distribution simulating unit connected to the exposure condition calculating unit and incorporating an optical simulation tool,

wherein exposures are applied on a first mask having a mask pattern to form resist patterns by the exposure device;

an exposure curve of sizes of the formed resist patterns to quantities of the applied exposures is calculated by the exposure calculating unit;

an optimum exposure quantity to be applied to the first mask is calculated from the exposure curve to provide a first resist pattern corresponding to the mask pattern of the first mask;

an optical intensity distribution on a wafer in a case where the first mask is first used and an optical intensity distribution on the wafer in a case where a second mask having a mask pattern is later used, are simulated;

a difference in optical intensity between [[a]] the first mask ~~to be first used~~ and [[a]] the second mask ~~to be later used~~ is calculated from the simulated optical intensity distributions by the optical intensity distribution simulating unit, and

an optimum exposure quantity to be applied to the second mask is calculated from the optimum exposure quantity to be applied to the first mask and the difference in optical intensity by the exposure condition calculating unit to provide a second resist pattern corresponding to the mask pattern of the second mask.

9. (Currently Amended) The exposure quantity calculating system [[8,]] according to claim 8, wherein the exposure device is an excimer laser exposure device.

10. (Currently Amended) The exposure quantity calculating system [[8,]] according to claim 8, wherein the mask pattern of the mask is a line-and-space pattern.

11. (Currently amended) An exposure quantity calculating system comprising:

an exposure device;

exposure calculating unit connected to the exposure device, an input unit configured to input data, a mask pattern size measuring unit configured to measure a size of a mask pattern of a mask, a resist pattern size measuring unit configured to measure a size of a pattern formed on a resist film, and a storage configured to store data; and

an optical intensity distribution simulating unit connected to the exposure condition calculating unit and incorporating an optical simulation tool,

wherein exposures are applied on a first mask having a mask pattern to form resist patterns by the exposure device;

an exposure curve of sizes of the formed resist patterns to quantities of the applied exposures is calculated by the exposure calculating unit;

an optimum exposure quantity to be applied to the first mask is calculated from

the exposure curve to provide a first resist pattern corresponding to the mask pattern of the first mask;

an exposure quantity difference is calculated from a mask pattern size difference of mask patterns between the first mask and a second mask having a mask pattern by an optical simulation;

a [[ratio]] percentage of the exposure quantity difference based on [[a]] the mask pattern size difference ~~of mask patterns~~ between [[a]] the first mask ~~to be first used~~ and [[a]] the second mask ~~to be later used~~ is calculated from the exposure quantity difference by the optical intensity distribution simulating unit, and

an optimum exposure quantity to be applied to the second mask is calculated from the optimum exposure quantity to be applied to the first mask and the percentage of the exposure quantity difference by the exposure condition calculating unit to provide a second resist pattern corresponding to the mask pattern of the second mask.

12. (Currently Amended) The exposure quantity calculating system [[11,]] according to claim 11, wherein the exposure device is an excimer laser exposure device.

13. (Currently Amended) The exposure quantity calculating system [[11,]] according to claim 11, wherein the mask pattern of the mask.

14. (Withdrawn) A method of manufacturing a semiconductor device comprising:

preparing a first mask in which a size of a mask pattern is measured in advance;

calculating a first exposure quantity to be applied to the first mask to provide a first resist pattern by using the first mask;

simulating optical intensity distributions on a wafer in a case where the first mask is used and an optical intensity distribution on the semiconductor wafer in a case where a second mask is used, a size of a mask pattern of the second mask being measured in advance;

calculating a difference in optical intensity between the first mask and the second mask from the simulated optical intensity distributions;

calculating a second exposure quantity to be applied to the second mask to provide a second resist pattern, from the first exposure quantity and the difference in optical intensity;

exposing a semiconductor wafer to light with the calculated second exposure quantity via the second mask to form the second resist pattern in a resist film formed on the semiconductor wafer and etching unnecessary portions of the resist film; and

forming a patterned layer on the semiconductor wafer by using the second resist pattern as a mask.

15. (Withdrawn) The method of manufacturing a semiconductor device according to claim 14, wherein the mask pattern of each of the first mask and the second mask is a line-and-space pattern.

16. (Withdrawn) A method of manufacturing a semiconductor device comprising:

preparing a first mask in which a size of a mask pattern is measured in advance;

calculating a first exposure quantity to be applied to the first mask to provide a first resist pattern by using the first mask;

exposing a semiconductor wafer to light with the calculated first exposure quantity via the first mask to form the first resist pattern in a resist film formed on the semiconductor wafer and etching unnecessary portions of the resist film;

forming a patterned layer on the semiconductor wafer by using the first resist pattern as a mask;

calculating an exposure quantity difference from a mask pattern size difference of mask patterns between the first mask and a second mask by an optical simulation, a size of a mask pattern of the second mask being measured in advance;

calculating a ratio of the exposure quantity difference in the second mask with respect to the first exposure quantity to be applied to the first mask, from the exposure quantity difference; and

calculating a second exposure quantity to be applied to the second mask to provide a second resist pattern, from the first exposure quantity and the ratio of the exposure quantity difference; and

exposing the semiconductor wafer to light with the calculated second exposure quantity via the second mask to form the second resist pattern in a resist film formed on the semiconductor wafer and etching unnecessary portions of the resist film; and

forming a patterned layer on the semiconductor wafer by using the second resist pattern as a mask.

17. (Withdrawn) The method of manufacturing a semiconductor device according to claim 16, wherein the mask pattern of each of the first mask and the second mask is a line-and-space pattern.

18. (Withdrawn) A method of manufacturing a semiconductor device comprising:

preparing a first mask in which a size of a mask pattern is measured in advance;

calculating a first exposure quantity to be applied to the first mask to provide a first resist pattern by using the first mask and a first exposure device;

simulating an optical intensity distribution on a wafer in a case where the first mask is used and an optical intensity distribution on the wafer in a case where a second mask is used, a size of a mask pattern of the second mask being measured in advance;

calculating a difference in optical intensity between the first mask and the second mask from the simulated optical intensity distributions;

calculating a second exposure quantity to be applied to the second mask to provide a second resist pattern in a case where the first exposure device is used, from the first exposure quantity and the difference in optical intensity;

determining a third exposure quantity to be applied to the first mask to provide the first resist pattern in a case where the second exposure device is used, from exposure data accumulated, and calculating a difference between the third exposure quantity and the first exposure quantity;

calculating a fourth exposure quantity to be applied to the second mask to provide the second resist pattern in a case where the second exposure device is used, from the difference in exposure quantity and the difference in optical intensity;

exposing a semiconductor wafer to light with the calculated fourth exposure quantity by using the second exposure device via the second mask to form the second resist pattern in a resist film formed on the semiconductor wafer and etching unnecessary portions of the resist film; and

forming a patterned layer on the semiconductor wafer by using the second resist pattern as a mask.

19. (Withdrawn) The method of manufacturing a semiconductor device according to claim 18, wherein the mask pattern of each of the first mask and the second mask is a line-and-space pattern.

20. (Withdrawn) The method of manufacturing a semiconductor device according to claim 18, wherein each of the first exposure device and the second exposure device is an excimer laser exposure device.